

NSLS-II PTOp

National Synchrotron Light Source II Project Transition to Operations Plan

March 17, 2011 Initial Draft in Development

BROOKHAVEN NATIONAL LABORATORY

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Brief Summary

The purpose of this document, the National Synchrotron Light Source II Project Transition to Operations Plan (NSLS-II PTOp) is to describe the elements of planning that will lead to the successful transfer of the scope of the NSLS-II construction project to operations by the BNL Photon Sciences directorate. A companion Document, the Facility Transition to Operations Plan (FTOP) describes the integration of the NSLS-II Project scope into the portfolio of related activities carried out by the Photon Sciences directorate that will combine to realize the overall NSLS-II Facility.

Revision History

2011 March 17 Revision 1 Initial Draft

1 Scope

1.1 Identification

The purpose of the National Synchrotron Light Source II Project Transition to Operations Plan (NSLS-II PTO) is to identify and describe the elements of planning that will lead to the successful transfer of the scope of the NSLS-II construction project to operations by the BNL Photon Sciences directorate. The documents and processes it describes will be detailed and developed as the project progresses. The items contained in the plan represent a 'check-list' of activities to assure the project objectives have been met and that the facility can be safely brought into operation as intended.

1.2 NSLS-II PTO Objective

The NSLS-II PTO provides a comprehensive plan to manage the smooth turnover of the NSLS-II project deliverables and a seamless hand-off of responsibility/ownership. The PTO is prepared to ensure efficient and effective management of the transition scope, align schedules, identify resources to facilitate project transition, and provide proper customer/sponsor/stakeholder interfaces. This includes identification of key staff responsibilities, essential program requirements, facility acceptance criteria, technical equipment installation and acceptance criteria, authorization basis and approvals and operational controls.

This plan has been formulated to ensure that the transition to operations and routine operations of the NSLS-II facility are consistent with:

- DOE Orders
- Recognized standards
- BNL ESSH&Q Vision and Policy
- Directions from the BHSO Federal Project Director and the Site Manager of BHSO
- NSLS-II facilities goals
- User community needs
- Lessons Learned and
- Additional concerns that BNL, DOE and contractor personnel identify during the construction, use and maintenance of the facility.

This plan is intended to provide the overall structure and be integrated with other BNL and Project documents including the Project Execution Plan, project resource loaded schedule, Risk Management Plan, Beneficial Occupancy Readiness Evaluation Plan, Accelerator Commissioning Plan, and Start-up Test Plan but is not intended to supersede those documents. The PTO document was prepared in accordance with DOE Guidance 413.3-16, *Project Transition/Closeout*.

1.3 NSLS-II PTOPT Overview

1.3.1 Document Outline

The basic scope and supporting documentation for the NSLS-II PTOPT are provided in sections 1 and 2. Section 3 outlines the elements of the transition to operation of the NSLS-II Project scope. They are numbered to align with section 5 of DOE G 413.3-16 "Project Transition/Closeout (CD-4)".

Section	Title	Section	Title
3.1	Project Description	3.16	Safeguards and Security Docum
3.2	Planning Management	3.17	Permits/Licenses
3.3	DOE Orders and Guidance	3.18	Authorization and Notification
3.4	Key transition Phase Steps	3.19	Project Transfer to operations
3.5	Strategy	3.20	Business Functions
3.6	Operation Cost	3.21	Project Information and Record
3.7	Organization and Stakeholder Interface	3.22	Transition to Operations Report
3.8	Transition Team	3.23	User/Operating Staff Planning
3.9	Configuration Control	3.24	Lessons Learned
3.10	KPP's and Completion criteria	3.25	Project De-staffing Plan
3.11	Schedule and Key Milestones		
3.12	Readiness Reviews		
3.13	Operations and Maintenance Management		
3.14	Facility Support, Op'n & Maint Training		
3.15	ES&H and QA Documentation plan		

Because the PTOPT is continuously evolving, these elements may include descriptions of Open Issues or Risks. The intention is to maintain visibility for issues that have not yet been defined or those which present a risk to the successful execution of the transition plan element.

1.3.2 Document Updates

The NSLS-II PTOPT is a controlled document which will be revised under change control. Revisions will be initiated as necessary to reflect the planned activities for project close-out and transfer of project scope to the Photon Sciences directorate.

2 Reference Documents

2.1 Government Documents

DOE Order 413.3B Program Management for the Acquisition of Capital Assets
DOE Order 420.2B Safety of Accelerator Facilities
DOE Guide 420.2-1 Accelerator Facility Safety Implementation Guide
DOE Order 422.1 Conduct of Operations
10 CFR 835 Occupational Radiation Protection Program
10 CFR 851 Worker Safety and Health Program

2.2 BNL Documents

BNL Policy and Management Guidance

BNL ESSH&Q Vision and Policy

Standards Based Management System (SBMS), in particular

- SBMS Subject Area “Accelerator Safety”
- SBMS Subject Area “Conduct of Operation Matrix Development”

2.3 NSLS-II Documents

Project Execution Plan

Risk Management Plan

Beneficial Occupancy Readiness Evaluation Plan

Accelerator Commissioning Plan

Beamline Commissioning Plan

NSLS-II Start-up Test Plan

2.4 Other Documents

None

3 - Transition to Operations Plan

The elements of this section are numbered to align with the components of the DOE G 413.3-16 'Project Transition/Closeout (CD4)'. The DOE guide numbers are retained to assist the user of the document and if they do not apply for NSLS-II it is so noted.

Each element is described and where applicable *Open Issues or Risks* for the transition element are included. This last point recognizes the fluid and developing nature of the PTO and identifies potential risks to execution of the transition plan element. The aim is to capture all known relevant issues even if they have not yet been settled to assist in further refinement of the document.

3.1 Project Description

Discussion

The National Synchrotron Light Source II (NSLS-II) is being built to be a world-class user facility for scientific research using synchrotron radiation. NSLS-II will be the brightest synchrotron source worldwide in the low- and medium-energy ranges and will replace the existing NSLS as the only high-performance synchrotron source located in the U.S. Northeast.

The NSLS-II construction project, which started construction in 2009 is scheduled to be complete in June 2015 and is currently projected to be complete in March, 2014. It provides for the design, building, and installation of the accelerator hardware, civil construction, and facilities including offices and laboratories required to produce a new synchrotron light source. It includes a third generation storage ring operating at 3 GeV, full energy injector, experimental areas, and

appropriate support equipment, all housed in a new building. The NSLS-II construction project scope also provides an initial suite of six “best-in-class” beamlines.

The NSLS-II facility will replace the existing NSLS facility.

Open Issues or Risks

Several initiatives are being undertaken ‘off-project’ to increase the portfolio of available instruments at project turnover. These must be integrated into the facility without adversely impacting the project schedule or scope.

3.2 Planning Management

As part of the NSLS-II Project Planning, various documents and processes were outlined that relate to the validation of the project scope and preparations for operations. These include the Project Execution Plan, and a series of documents related to Beneficial Occupancy Readiness Evaluations (BORE), Accelerator Readiness Reviews (ARR), Safety Assessment Documents (SAD), and Start-up Test and commissioning plans. These have all been created during the course of the management of the project and coordinated by the project management. To assist in the integration and coordination of these activities, the Integrated Transition Management Team (ITMT) was chartered by the ALD for Photon Sciences. Its function is to

- develop and manage the transition plans and documentation,
- ensure all interfaces are identified, defined and managed,
- ensure ES&H and QA goals are achieved for the transition activities,
- support the preparation, review, and approval of project documentation, including closeout
- Identify and manage transition related risks and issues

This document is one of the work products of the ITMT. Other sections of the document describe elements of the transition plan to ready NSLS-II for operations. A companion document, the Photon Sciences Facilities Transition to Operations Plan (FTOP) guides the integration of the NSLS-II Project scope into the portfolio of directorate activities.

Open Issues or Risks

The TOP process is in a formative stage which carries risks of potential omissions. As the plan matures this risk exposure is expected to be reduced.

3.3 DOE Orders and Guidance

DOE Orders and Guidance documents are referenced in Section 1.2 of this document.

Open Issues or Risks

There is a remaining potential risk for changes in DOE Directives or Guidance as the project nears its transition from construction into operations. An earlier concern over a major change in the Accelerator Safety Order DOE 420.2 does not appear to have materialized and does not represent a significant risk at this time.

3.4 Key transition Phase Steps

The NSLS-II Project pre-operations activities started in FY2011 and support installation and commissioning activities and represent the leading edge of the transition to operations. These activities, including Beneficial Occupancy Reviews, Accelerator Readiness Reviews, Beamline Readiness Reviews etc, have been thoroughly planned and reviewed. The work definition and resources for this scope of work are well defined and contained in the NSLS-II baseline. The overall flow through the transition to operations is illustrated in Figure 3.4.1.

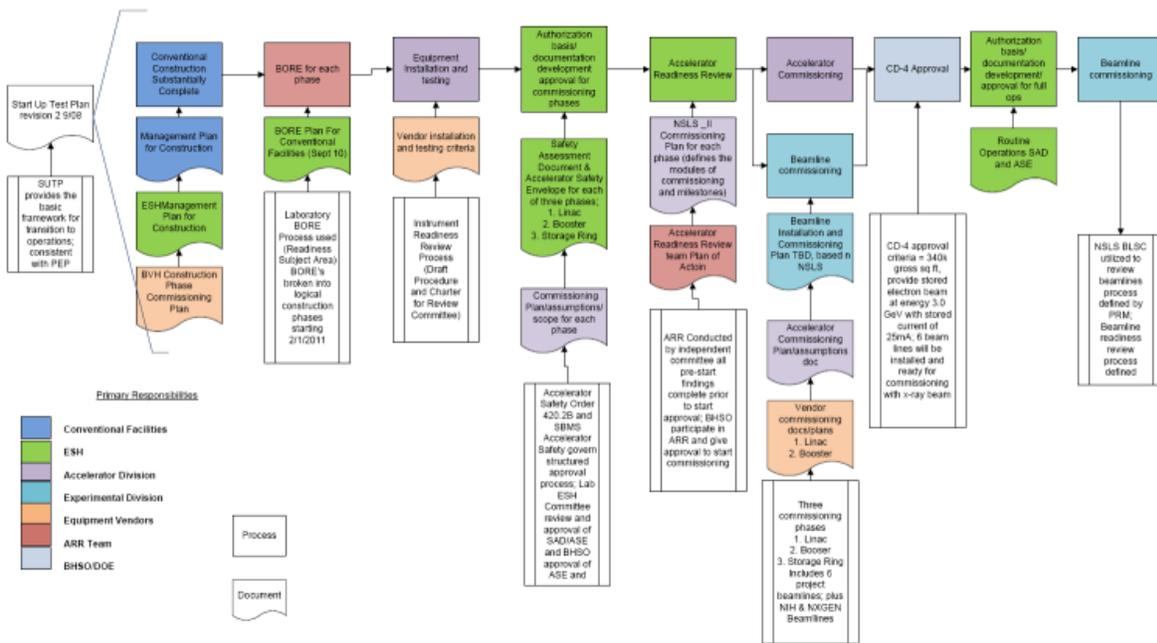


Figure 3.4.1 NSLS-II Transition to Operations flow.

The transition to operations period lasts approximately 53 months, from February 2011 (initial Phase One BORE) to June 2015 (CD-4). It begins with the Beneficial Occupancy Readiness Evaluation (BORE), which is detailed in the [NSLS-II BORE Documents](#). At the start of this period the NSLS-II facility will be turned over from the Prime Contractors, Torcon Inc. for the Ring Building and E.W. Howell for the LOBs to the NSLS-II Project Team in a phased approach

according to the BORE Plan. A successful BORE means that the construction of the NSLS-II facilities are essentially complete, that all life safety systems are installed and tested, and that the building is ready for occupancy. The BORE is a significant evaluation process that needs to be completed in order to install accelerator and beamline components.

The next phase is the technical equipment installation, testing and commissioning of the Accelerator Systems. Activities for the installation and testing are detailed out in the project's resource loaded schedule. The Accelerator Commissioning Plan^[ref] describes the requirements to perform commissioning, the assumptions regarding boundary conditions for commissioning, the goals of commissioning, and the detailed plan to carry out commission in several phases. Accelerator Readiness Review (ARR) will be the last step in this phase, which verifies that all steps for the Authorization Basis (AB) are complete and well documented.

For Conventional Facilities and Accelerator Systems, successful BORE or ARR of the subsystems (Ring Building, LOBs, LINAC, Booster, Storage Ring etc.) will mark the completion of the project portion of activities and start of the early operations phase for the subsystem.

The technical equipment installation and testing of the beamlines will be carried out in parallel with the installation, testing and commissioning of the Accelerator Systems and is detailed out in the project's resource loaded schedule. Instrument Readiness Reviews (IRR) will be the last step in this phase, which verifies that all steps required to operate the beamline are complete and well documented.

The final phase of the transition to operation will start when all subsystems are in early operations phase. Checkout, test, acceptance, and pre-operations of facility components will be addressed by appropriate planning for all aspects of bringing the individual components online to support integrated operation of the complete facility, to address the operating procedures and maintenance requirements of the facility, and to provide the necessary technical personnel and operator training and qualification. An Operational Readiness Review (ORR) will be conducted to make this determination and it will signify that the NSLS-II Operations Staff is appropriately complemented and fully trained, and that all administrative controls and documents are in place to support operation in full compliance with all applicable BNL and DOE requirements.

3.5 Strategy

To bring NSLS-II into operations, a sequence of steps has been identified for each of the major areas including Conventional, Accelerator and Experimental Facilities. In the case of conventional facilities the BORE process is used to verify that the building and its systems are ready for beneficial occupancy. This includes the validation of the construction against the design criteria, inspection to assure that all safety requirements are met, and documentation of the facilities for turnover to BNL from the contractor. Systems in the accepted scope are assigned to organizations for their ongoing operation and maintenance. For many of the building systems this scope is transferred to BNL Facilities and Operations. Some special technical facilities are transferred to Photon Sciences for operations and maintenance.

A similar process flow is employed for the technical construction elements, namely accelerator and experimental facilities. The design criteria and authorization basis are established, the system is constructed, it then undergoes integrated testing and commissioning, with milestone

evaluations to validate attainment of the designed scope and reviews to authorize progression to the next phase of commissioning or operations. The process and responsibilities for establishing the Accelerator Commissioning and Operation Authorization are shown in the figure below.

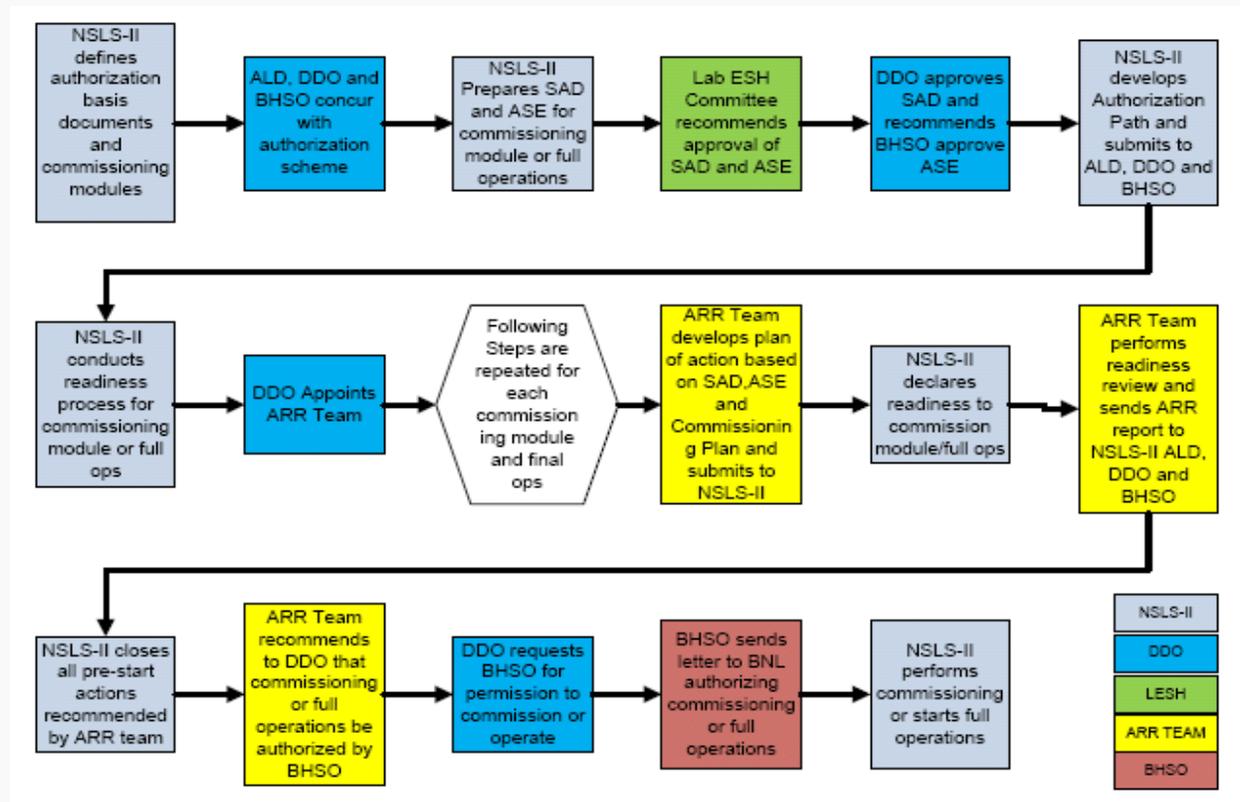


Figure 3.5.1 Accelerator Commissioning and Operations Authorization flow.

A similar process is envisioned for the experimental facilities but is not yet as mature as the conventional or accelerator facilities. It should be noted that a process exists and has been in use at the NSLS which will be adapted for the NSLS-II Project.

Open Issues or Risks

The process for experimental facilities commissioning and authorization basis needs to be articulated. Even though commissioning activities are 'off project scope' CD-4 depends upon having the beamlines ready for commissioning and in all likelihood commissioning of at least some of the beamlines will start before CD-4 is attained.

3.6 Operation Cost

NSLS-II will be the central focus for the portfolio of Photon Sciences operational activities after its completion. Some operating costs are anticipated before CD-4, as the project and its scope becomes available (and must be maintained) in stages stretching out over several years. NSLS-II was also designed with substantial affordances for hosting beamlines well beyond the project scope of six instruments. The construction of many of these instruments will be funded as separate MIE projects or funding from other sources like NIH. Operations of most of these instruments, as well as construction of some (notably NxtGen) will be part of the operating cost of the facility.

Operations funding prior to completion of the NSLS-II Project is to support the following activities:

- a) Early Operations: Maintenance, operations, and utility costs for the conventional facilities (Ring Building, etc) after taking beneficial occupancy, and maintenance, operations, and utility costs for completed accelerator subsystems (Linac, Booster, and their associated utility, controls, vacuum, instrumentation and safety protection subsystems)
- b) NxtGen: Planning, engineering design, and implementation of a number of bending magnet and three pole wiggler (3PW) beamlines for NSLS –II, primarily to support programs transferred from NSLS and reusing equipment from NSLS beamlines

Operations funding after NSLS-II Project completion is to support the following activities:

- a) Full Operations of NSLS-II Facility, including conventional facilities, accelerator, and beamlines
- b) NxtGen: Completing implementation of bending magnet and 3PW beamlines

The development of estimates for the operating cost of NSLS-II is the subject of continuing work and refinement with the exploration of many possible scenarios.

Estimates for the operating costs for the entire Photon Sciences portfolio are also under development and will be captured in the Photon Sciences FTOP.

Open Issues or Risks

The development of the operating budget projections is in a preliminary stage and is subject to change as the estimates are refined.

3.7 Organization/Stakeholder Interface

3.07.1 Management Organization

The following organizations and individuals form the chain of authority and communications for the NSLS-II Project. This represents the line of accountability for the project down to the transition team assigned to facilitate its transfer to routine operations.

DOE Office of Basic Energy Sciences

The DOE Office of Basic Energy Sciences (BES) is the DOE/headquarters organization that has programmatic and financial responsibility for construction and operation of NSLS-II, including oversight for the transition activities.

DOE Office Brookhaven Site Office

The DOE Brookhaven Site Office (BHSO) will provide Federal oversight for construction and operation of NSLS-II including legal, contracting and environmental management. The NSLS-II Federal Project Director within BHSO has responsibility and authority for execution of the NSLS-II project as well as the transition activities. Additional support to the NSLS-II Federal Project Director will be provided by BHSO matrix organizations at the level required.

BNL Photon Sciences Directorate

The Photon Sciences (PS) directorate is responsible for carrying out the transition activities. The functional organization illustrated in Figure 3.7.1 is sufficiently adaptive to sustain us through the transition from the current mix of projects and well into NSLS-II operations without the need for any future major reorganization. It provides the flexibility to easily and rapidly reassign staff as necessary in response to the changing work load as the projects in our portfolio evolve.

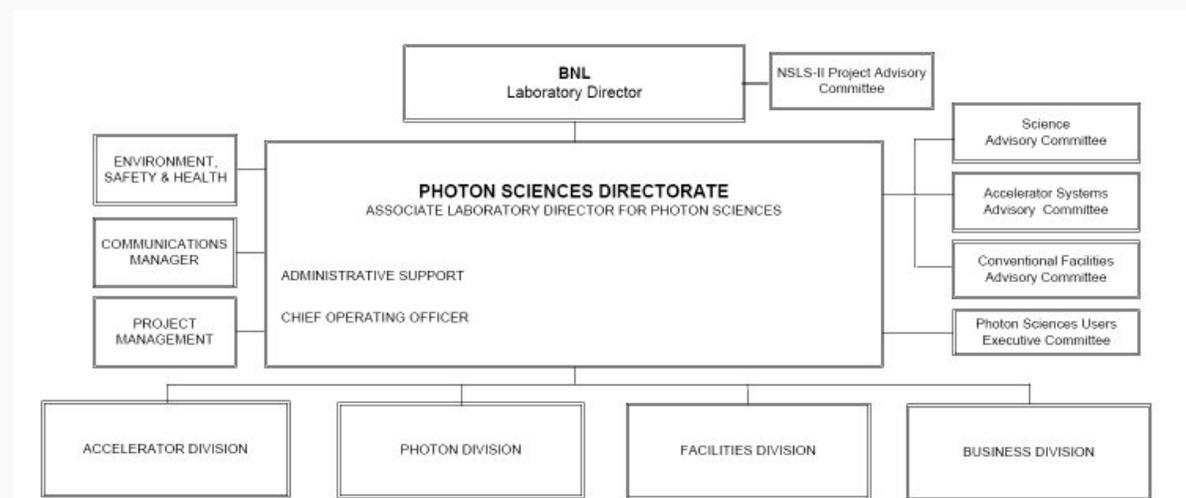


Figure 3.7.1 Photon Sciences directorate high level organization chart.

Associate Laboratory Director for Photon Sciences

The Associate Laboratory Director (ALD) for Photon Sciences has overall responsibility for leading the transition activities by establishing organization structure, assigning managers, and defining roles and responsibilities.

NSLS-II Project Director

The NSLS-II Project Director has line management responsibility for implementation of the Transition to Operations Plan. The NSLS-II Project Director is supported by a Deputy Project Director. The NSLS-II Deputy Project Director is responsible for day-to-day project management of the NSLS-II Project, ensuring that the project and its transition to operation are completed safely, on time, and within budget.

Integrated Transition Management Team

The Integrated Transition Management Team (ITMT) is responsible for developing and overseeing the transition plan. The ITMT and its team leader will be appointed by the ALD for Photon Sciences. The team membership will change as the transition phases progress to ensure the participating subsystems are always represented.

The ITMT will:

- Develop and participate in transition planning.
- Ensure all interfaces are identified, completely defined, and managed.
- Support the preparation, review, and approval of project documentation.
- Identify and resolve issues.
- Plan and participate in reviews, assessments, and appraisals as necessary.
- Plan and participate in operational readiness assessments.
- Support the preparation, review, and approval of project completion and closeout documentation.

The ITMT leader's responsibilities involve:

- Defining and leading the ITMT
- Developing and implementing key transition documentation;
- Serving as the single point of contact for all matters relating to the implementation of transition plan;
- Proactively identifying and ensuring timely resolution of critical issues which impact transition activities;
- Ensuring that the Project's ES&H and QA goals are achieved;
- Identifying and managing risks;
- Keeping the ITMT and upper management informed with timely status reports;
- Scheduling and holding regular meetings;
- Approving changes in compliance with the approved change control process documented.

3.07.2 Stakeholders

In addition to the management chain, there is a further community of stakeholders who are interested parties in the status of the NSLS-II project.

Photon Sciences User Community

The existing NSLS facility hosts a large and vibrant community of users of the light produced by the NSLS. In addition to existing users of the NSLS facility, new users are slated to work at NSLS-II who in many cases could not achieve their scientific aims with the capabilities of NSLS. It is vital that this group of stakeholders stay apprised of the status of the project, particularly of the transition to operations.

Photon Sciences Directorate Staff

These are the people responsible for the construction and ultimate operation of the NSLS-II facility as well as other components of the Photon Sciences directorate portfolio. The directorate is structured with four divisions (Accelerator, Photon, Facilities, Business) and two groups (ES&H, Communications) that report to the ALD for Photon Sciences.

Science Advisory Committee (SAC)

The Photon Sciences Science Advisory Committee (SAC) is advisory to the Associate Laboratory Director (ALD) for Photon Sciences at Brookhaven National Laboratory (BNL). The SAC has the responsibility to provide recommendations on all scientific and policy issues that bear on the full and effective utilization of the BNL Photon Sciences facilities and on future developments required to maintain the scientific productivity of BNL Photon Sciences programs at the highest possible level.

Accelerator Systems Advisory Committee (ASAC)

The Accelerator Systems Advisory Committee (ASAC) is composed of external experts trained in accelerator physics and engineering who are familiar with the design, construction, and operations of major accelerator systems. This group advises the ALD for Photon Sciences and the Director of the Accelerator Division and provide guidance to the NSLS-II accelerator team on technical choices, trade-offs, and decisions; value engineering; measures to improve availability and reliability of operations; diagnostics and controls; etc.

Conventional Facilities Advisory Committee (CFAC)

The Conventional Facilities Advisory Committee (CFAC) is composed of external experts trained in conventional construction, most of whom have had extensive experience in designing and constructing conventional facilities and the supporting infrastructure associated with major scientific user facilities. This group will advise the ALD for Photon Sciences and the Director of the Facilities Division and provide guidance to the NSLS-II conventional facilities team on the development of the improvements to land, conventional construction, and utilities systems required to deliver the maximum benefit to the users.

Users Executive Committee (UEC)

The Users Executive Committee (UEC) is the leadership group for the Photon Sciences Users' Association which has the objectives of promoting and encouraging research at Brookhaven's world leading synchrotron user facilities, to provide opportunities for the user community to exchange ideas and concerns, and to communicate user needs to facility management. Facility management includes the Photon Sciences, Brookhaven National Laboratory and the Department of Energy. The Association also serves as a channel of dissemination of relevant information on facility plans and prospects to the user community.

Open Issues or Risks

Photon Sciences has an extremely large community of stakeholders who are interested in the plans for NSLS-II and its transition to operations. Stakeholder communications with such a large group is challenging and will require adequate attention and resources to be successful.

3.8 Transition Team

The NSLS-II Transition to Operations is managed by an Integrated Transition Management Team (ITMT). The key responsibilities of the team are

- Develop and manage transition plans and documentation
- Ensure that all interfaces are identified, defined and managed
- Ensure that ES&H and QA goals are achieved for transition activities
- Support the preparation, review and approval of project documentation, including project closeout.
- Identify and manage transition related risks and issues

The core membership of the ITMT has been identified and assigned and includes Aesook Byon (Deputy ALD for Construction), Diane Hatton (COO), Steve Hoey (ES&H Manager), and Erik Johnson (Deputy ALD for Programs). Erik Johnson has been appointed overall Facility to Transition Operations Manager with the charge of

- Leading the ITMT
- Serving as point of contact for matters related to implementation of the transition
- Holding regularly scheduled transition meetings
- Keeping PS management informed of transition issues in a timely manner.

The ITMT will function by forming working groups or task forces for particular topical areas. Examples include Beneficial Occupancy Evaluations, Installation, Commissioning, and ARR processes. The ITMT will draw from the Photon Sciences directorate and more broadly as needed to accomplish its work. The ITMT reports to the ALD for Photon Sciences. Reporting on the activities of the ITMT to DOE is through the ALD.

Open Issues or Risks

None identified at the initial drafting of the PTOP.

3.9 Configuration Control

The process for the configuration of the baseline scope is well defined for the NSLS-II Project and will also be followed during the transition to operations phase until the approval of CD-4, project completion, is granted. When changes become necessary, the change control process will be used, as defined by Section 8 of the NSLS-II Project Execution Plan and detailed in the NSLS-II Configuration Management Plan. The technical baseline will continue to be maintained in the NSLS-II WBS Dictionary, the NSLS-II Global Parameters List, and the NSLS-II Global Requirements Document.

Upon the project completion, any changes necessary will follow the change control and documentation processes according to the Photon Sciences directorate Configuration Management System.

Open Issues or Risks

None identified at the initial drafting of the PTOP

3.10 KPP's and Completion criteria

Project completion (CD-4) will be accomplished when the scope defined to level 3 in the WBS Dictionary has been delivered and demonstrated to be functioning by achieving the Threshold Key Performance Parameters at Project Completion listed in Table 3.10.1 The WBS Dictionary is under change control as defined in Section 8 of the NSLS-II Project Execution Plan. The KPPs indicate completion of the construction project and will enable the capability of NSLS-II to ultimately achieve spatial resolution of about 1 nm and energy resolution of about 0.1 meV. Demonstration of these resolutions is not expected at project completion and it is expected that additional effort beyond project completion will be needed in order to achieve them.

Table 3.10.1 NSLS-II Threshold Key Performance Parameters at Project Completion

Key Parameters	Performance
Accelerator Facilities	
Electron Energy	3.0 GeV
Stored Current	25 mA
Conventional Facilities	
Building Area	> 340,000 GSF
Experimental Facilities	
Beamlines installed and ready for commissioning with X-ray beam	6

Prior to CD-4, a period of commissioning and performance testing for NSLS-II will be completed as technical systems and facilities are installed. When the scope defined to level 3 in the WBS Dictionary has been delivered and demonstrated to be functioning by achieving the Threshold Key Performance Parameters at Project Completion and has been certified to operate properly and safely, the project and DOE managers will recommend facility acceptance and approval of CD-4.

The key deliverables from the transition activities will be a set of acceptance, approval and operational documentations to support the Operational Readiness Reviews and fulfill the requirements for the Project Completion Reports. The documentations required for each transition phase are listed in Appendix A. Note that the deliverables from the NSLS-II Project are well defined in its WBS Dictionary and the deliverables from other beamline projects will be defined in their associate project WBS Dictionaries.

Open Issues or Risks

None identified at the initial drafting of the PTOP

3.11 Schedule and Key Milestones

The lists of Level 1 and Level 2 milestones and completion criteria for the NSLS-II Project from FY11 to FY15 are shown tables below.

Table 3.11.1 NSLS-II Project Level 1 Milestones and Completion Criteria

Code	Title	Completion Criteria	Date
L100060	BOD of Experimental Floor Space	Completion of this milestone is defined as the date on which beneficial occupancy of a portion of the Ring Building is transferred from the Conventional Facilities Division to the Accelerator Systems Division after all reviews and approvals required by the Readiness Evaluations Subject Area have been completed. This milestone authorizes beneficial occupancy of a portion of the experimental floor for the purposes of installing and commissioning beamlines and equipment, including those not associated with the NSLS-II Project.	8/6/12
L100900	NSLS-II DOE Early Project Completion	This milestone is the early completion for CD-4 including three additional months of float. See Section 4.4 of the PEP base document for the milestone definition for CD-4. Completion of this milestone is defined as issuance of a signed Decision Memorandum from the SAE approving CD-4.	9/30/14
L100100	CD-4, Approve Project Completion*	See Section 4.4 of the PEP base document for milestone definition. Completion of this milestone is defined as issuance of a signed Decision Memorandum from the SAE approving CD-4.	6/26/15

Table 3.11.2 NSLS-II Project Level 2 Milestones and Completion Criteria

Code	Title	Completion Criteria	Date
1.01 Project Management			
L200320	Issue Initial FSAD for Approval	Defined as the completion of the Final Safety Assessment Document (FSAD) and submission to DOE for approval. Milestone complete will be achieved upon the issuance of this document, via transmittal record, from the NSLS-II Project Director to the NSLS-II Federal Project Director.	3/3/14
L200600	NSLS-II Project Early Completion	This milestone is the early completion for CD-4. See Section 4.4 of the PEP base document for the milestone definition for CD-4. Completion of this milestone is defined as issuance of a signed Decision Memorandum from the SAE approving CD-4.	6/25/14
1.03 Accelerator Systems			
L200380	Front-End Beam Available to Linac	Defined as the completion of initial front-end commissioning activities and the front-end diagnostic equipment and beam stop being removed. The remaining front-end commissioning	12/17/12

		activities will occur concurrently with Linac commissioning. The completion of this milestone will be granted upon receipt by the NSLS-II Federal Project Director of a memorandum, with supporting technical documentation, from the NSLS-II Project Director stating that initial commissioning requirements have been achieved and that the beam is now available to the Linac.	
L200400	Linac Beam Available to Booster	Defined as the completion of initial Linac commissioning activities and the completion of Linac-to-Booster transport section commissioning. The remaining Linac commissioning activities will occur concurrently with ring commissioning. The completion of this milestone will be granted upon the receipt by the NSLS-II Federal Project Director of a memorandum, with supporting technical documentation, from the NSLS-II Project Director stating that initial commissioning requirements have been achieved and that the beam is now available to the Booster.	2/22/13
L200440	Ring Beam Available to Beamlines	Defined as the completion of initial ring commissioning activities and the completion of the beam dump commissioning. The remaining ring commissioning activities will occur concurrently with beamline commissioning. The completion of this milestone will be granted upon the receipt by the NSLS-II Federal Project Director of a memorandum, with supporting technical documentation, from the NSLS-II Project Director stating that initial commissioning requirements have been achieved and that the beam is now available to the beamlines.	6/25/14
1.04 Experimental Facilities			
L200350	Experimental Facilities Beamlines Design Complete	Defined as the completion of all beamline Final Design Reviews that are required before beamline installation can proceed. Completion of this milestone will be granted upon the receipt of a memorandum from the NSLS-II Project Director to the NSLS-II Federal Project Director that this condition exists.	2/7/12
1.05 Conventional Facilities			
L200340	Injection Building BOD	Defined as the date on which beneficial occupancy of the Injection building is transferred from the Conventional Facilities Division to the Accelerator Systems Division after all reviews and approvals required by the Readiness Evaluations Subject Area have been completed. The completion of this milestone will be granted upon the receipt of a memorandum from the NSLS-II Project Director to the NSLS-II Federal Project Director that this condition exists.	11/28/11
L200300	RF Building BOD	Defined as the date on which beneficial occupancy of the RF building is transferred from the Conventional Facilities Division to the Accelerator Systems Division after all reviews and approvals required by the Readiness Evaluations Subject Area have been completed. The completion of this milestone will be granted upon the receipt of a memorandum from the NSLS-II Project Director to the NSLS-II Federal Project Director that this condition exists.	5/18/11
L200280	Ring Building	Defined as the date on which beneficial occupancy of the first	2/1/11

	Pentant #1 BOD	pentant of the Ring Building is transferred from the Conventional Facilities Division to the Accelerator Systems Division after all reviews and approvals required by the Readiness Evaluations Subject Area have been completed. The completion of this milestone will be granted upon the receipt of a memorandum from the NSLS-II Project Director to the NSLS-II Federal Project Director that this condition exists.	
L200360	Ring Building Pentant #4 BOD	Defined as the date on which beneficial occupancy of the forth pentant of the Ring Building is transferred from the Conventional Facilities Division to the Accelerator Systems Division after all reviews and approvals required by the Readiness Evaluations Subject Area have been completed. The completion of this milestone will be granted upon the receipt of a memorandum from the NSLS-II Project Director to the NSLS-II Federal Project Director that this condition exists.	2/9/12
L2004200	Conventional Facilities Construction Complete	Defined as all conventional facility construction complete. After this point, any facility issues will be handled by maintenance. Completion of this milestone will be granted upon the receipt of a memorandum to the NSLS-II Federal Project Director from the NSLS-II Project Director that the facility has passed walk through inspection.	8/20/13

Open Issues or Risks

While the project milestones and high level portfolio schedule set the framework for TOP, more detail needs to be developed in the schedule.

3.12 Readiness Reviews

Beneficial Occupancy Readiness Review(s)

To achieve beneficial occupancy for NSLS-II, all essential prime contractor deliverables as outlined in the NSLS-II BORE Plan must be substantially completed for each phase except for minor punch list items, and final contract closeout. This will assure that a robust evaluation process can be performed.

As each of the NSLS-II Project Phases nears completion, the BORE Committee will perform the formal BORE walk through(s). Deficiencies (findings) will be identified and documented in the BORE Report. The appropriate BORE Committee Subject Matter Expert will determine if a finding is pre-occupancy or post-occupancy. All pre-occupancy findings will be resolved prior to the Committee granting beneficial occupancy. Post-occupancy findings will be tracked in the NSLS-II Family ATS until completion. Informal walk through at the discretion of the BORE

Committee preceding the formal walk through(s) will be conducted as needed to facilitate the process.

The prime contractor deliverables will be verified during the commissioning process and closeout process by the NSLS-II Project, Facilities & Operations and/or the Commissioning Contractor. The role of the BORE Committee is not to repeat this commissioning process but rather to confirm that the process has been adequately completed.

The NSLS-II Project will coordinate delivery schedules for technical equipment with the prime contractor's construction schedule to minimize double handling and storage of technical equipment. As such this will require a phased Beneficial Occupancy whereby individual facilities or sections of facilities are accepted prior to acceptance of the entire building to facilitate equipment staging. The NSLS-II Project Team in concert with the Laboratory BORE Review Team will review the criteria applicable to each phased acceptance of a space for Beneficial Occupancy and determine the applicable requirements. In all cases this acceptance will include the appropriate life safety requirements and the environmental and security requirements necessary to assure the equipment is maintained in a clean, dry, secure area with restricted access control.

Accelerator Readiness Review(s)

The Accelerator Readiness Reviews (ARR's) must be performed before approval for accelerator commissioning is given. NSLS-II commissioning will be accomplished in phased and discrete segments; the ARR's will also be performed incrementally to support this phasing.

All accelerator readiness reviews will be conducted as described in DOE Order 420.2B Safety of Accelerator Facilities and the BNL Accelerator Safety subject Area. The scope and schedule of each commissioning module will be established in the ARR Plan of Action prepared for each of the commissioning modules. The NSLS-II Federal Project Director will monitor and /or arrange DOE participation in the ARR, and will obtain BHSO Manager Authorization for the module's commissioning routine operations after determining that documentation and readiness are acceptable.

An ARR is conducted to verify the necessary safeguards and procedures are in place to permit safe operation of the facility or sub-facilities. The NSLS-II readiness reviews will address;

- Planning for the training and qualifications of operations, maintenance, and surveillance personnel;
- Conducting the necessary operational facility, systems, and equipment tests;
- Developing and approving the safety analysis including implementation of the safety and security analysis requirements, operations, maintenance, and surveillance procedures; and
- Documenting the completed work required to achieve readiness.

The NSLS-II strategy is to break the Authorization Basis process into four modules, consistent with 420.2B and the PEP, that coincide with the accelerator equipment installation & operations. The 4 modules are;

- LINAC (Including LINAC to Booster Transfer Line)
- Booster (including Booster to Storage Ring Transfer Line)

- Storage Ring
- Routine Operations (roll up of the first three modules)

An ARR Team will be appointed by the BNL Deputy Director for Operations (DDO). This team will be completely independent of the NSLS-II project and include expertise from other DOE accelerator facilities. It is envisaged that the same team appointed for the LINAC commissioning will follow through for the Booster, Storage Ring and Final Operations. A NSLS-II ARR Project Manager will be appointed to coordinate between the ARR Team and the project to assure that all necessary elements are in place to start the ARR, and will track to completion all pre and post start ARR items.

Open Issues or Risks

A process for evaluation of experimental facilities is in place for NSLS operations. It needs to be reviewed and adapted to the requirements of the NSLS-II facility and operations model.

3.13 Operations and Maintenance Management

A key component for the transition to operations is to provide the necessary staff, training and resources to operate NSLS-II conventional and technical facilities during initial building acceptance, through accelerator and beamline installation, and into initial accelerator and beamline operations.

The operation and maintenance of NSLS-II conventional facilities systems will begin after system commissioning and acceptance from the construction contractor as part of the beneficial occupancy readiness evaluation process (BORE). Prior to beneficial occupancy, building systems and utilities will have been tested, started and commissioned by the construction contractor with oversight by a commissioning contractor. This process includes training of operations and maintenance staff on each system and major equipment item and preparation of O&M manuals and training materials by the contractor and major equipment vendors. Training materials and O&M manuals are reviewed by the commissioning contractor and O&M staff for completeness. Training on systems and equipment is provided to O&M staff by equipment vendor technical staff during start-up. The O&M integrated facility management staff responsible for maintenance management of the NSLS-II complex are an integral part of the start-up, training and operations process. O&M documents provided by the manufacturers are reviewed and maintenance and spare parts requirements are incorporated in the maintenance management system database to support preventative and planned maintenance activities.

The process for the technical systems will follow a similar template although in this case the ultimate responsibility for operation and maintenance of these systems will reside entirely within Photon Sciences. In some instances, the equipment was designed and constructed by Photon Sciences and will transfer to the same divisions that were responsible for their construction. In other instances large systems (linac, booster, insertion devices) are constructed by vendors. Often as part of those contracts the vendors participate in the installation and/or commissioning of those systems. Schedules have been prepared for the project that include capture of the information for the ongoing operation and maintenance of these systems. In each case for the technical systems the commissioning activity represents a component of the training regimen for the staff who will be assigned to their operation and maintenance.

Open Issues or Risks

The requirements for critical spares needed for Conventional facilities to support technical facility availability targets are currently under review and will be incorporated in future development of this plan.

Budget projections for ongoing operations and maintenance of the facility are currently under development and need to be further refined.

3.14 Facility Support, Op'n & Maint Training

As part of the transition to operations, the project needs to provide staff that have the requisite skills and knowledge to test, start-up, commission and maintain operating systems to assure they meet performance and reliability goals. The plan for assuring that staff performing systems testing, start-up, commissioning, operations and maintenance relies on proper execution of the conventional construction contract and the BNL beneficial occupancy readiness evaluation process. Conventional facilities system testing is an integral part of the conventional construction contract and is verified by trained and experienced BNL construction inspectors and architect/engineer (A/E) field inspection staff. Commissioning of building and utility systems is performed by the construction contractor utilizing equipment vendor's trained technical staff and is verified by a BNL contracted commissioning contractor. Training of BNL O&M staff is an integral part of the construction and commissioning contractor work scopes and is performed during the equipment start-up and commissioning process prior to acceptance from the construction contractor as part of the beneficial occupancy readiness evaluation process (BORE). This process includes training of operations and maintenance staff on each system and major equipment item and preparation of O&M manuals and training materials by the contractor and major equipment vendors. Training materials and O&M manuals are reviewed by the commissioning contractor and O&M staff for completeness. The O&M integrated facility management staff responsible for maintenance management of the NSLS-II complex are an integral part of the start-up, training and operations process. Any facility or system specific training required beyond the start-up training is included as a requirement in the training database for specific operating staff. Training is also provided for emergency response staff (fire rescue, police) to assure familiarity with building systems and access requirements. These are documented in the fire protection system documentation and "Run Cards" utilized in the event of an emergency response.

Open Issues and Risks

None identified at the initial drafting of the PTOP.

3.15 ES&H and QA Documentation plan

All accelerator commissioning activities will be conducted as prescribed in the Commissioning Plan and within the boundaries defined in the applicable Accelerator Safety Envelope (ASE). The ASE is based on a detailed Safety Assessment Document (SAD), which describes in sufficient detail all significant hazards presented by the commissioning operations and the controls by which these hazards will be managed. The SAD defined the controls and standards

that must be incorporated into the facility design and operating procedures. It provides the basis for the ASE that must be prepared and proved by BNL and BHSO management prior to commissioning. Since accelerator subsystems will be commissioned in successive stages (first linac, then booster, and finally storage ring), approval to commission each subsystem will require the appropriate SAD and ASE prior to the start of commissioning. A complete facility Final SAD (or FSAD) and ASE will be completed and approved prior to CD-4 approval.

Approval of safety documentation and authorization to commission and operations of NSLS-II will occur prior to commissioning and operation of the NSLS-II facility systems, including the injector, storage ring and photon beam stops. The NSLS-II Federal Project Director is responsible for establishing the safety basis and operations in accordance with DOE Order 420.2B, Safety of Accelerator Facilities. Approval will be granted by the Brookhaven Site Office Manager

DOE is the approval authority to allow commissioning. This approval authority has been delegated to the Brookhaven Site Office (BHSO) for the NSLS-II accelerator. This approval requires a detailed authorization process, which addresses all of the relevant issues such as completeness of documentation, technical readiness, the training of the staff, the existence of detailed commissioning procedures, the assessment of hazards, safety and emergency procedures.

The site Construction Project ESH Plan was developed as a model plan that was used by the prime contractors to develop their site specific ESH Plan. Requirements from this plan are flowed down into the contractors site specific ESH plan which provides the implementation requirements and implementation methodologies necessary to comply with all DOE, BNL, Federal, State and Local Regulatory requirements. This plan has been updated periodically throughout the course of the conventional construction and will be updated at the completion of conventional construction and prior to CD-4 to include lessons learned over the course of the facility build and be a resource for future construction activities at the laboratory

The laboratory (including PS) is registered as a ISO 14001 Environmental Management System and OHSAS 18001 Health and Safety Management System. Maintenance of these registrations requires rigorous internal and external reviews to assure compliance with the management system requirements. The PS Environmental Management System and Occupational Safety and Health System are updated at least annually or when new significant aspects are introduced. All experiments are reviewed for environmental aspects through the Experiment Safety Approval Form process at the NSLS and the Project Safety Review Form process at NSLS-II. All personnel involved in a significant aspect receive specific training which emphasizes the operational controls to ensure safe work practices. In addition, the enhanced work planning program ensures additional reviews of on-going work as needed. A summary of operational controls and training for each of the work activities identified above can be found on the Photon Sciences directorate EMS-OHSAS web page. Photon Sciences directorate ESH personnel monitor changes in the BNL environmental requirements. Supervisors will be advised of any changes that require modification of work practices or training environmental and waste management programs.

Emergency plans are developed as per Laboratory guidelines for each facility. Since the NSLS-II Ring Building was commissioned in phases an emergency plan was developed for the first phase preceding occupancy of Pentant 1. This plan will be expanded as subsequent phases of the facility are completed and occupied. The Beneficial Occupancy Readiness Evaluation process confirms that all emergency planning is incorporated prior to occupancy.

Open Issues or Risks

None identified at the initial drafting of the PTOp.

3.16 Safeguards and Security Documents

The site security vulnerabilities and risks at Brookhaven National Laboratory Site are addressed by a laboratory wide “Report on Assessment of Security Risk at BNL”. This site wide report initially developed in June of 2001 preceded the design of NSLS-II. Revisions to this document have addressed the design, construction and ultimate operations of the NSLS-II facility beginning with a revision in September 2006. NSLS-II is included in all subsequent revisions most recently December 2010. This is an “Official Use Only” document and under the purview of the Laboratory Protection Division. This document was developed in concert with the Site Security Plan, Local Threat Statement, Local Counterintelligence Threat Statement, and Federal and Local Agencies. The document includes a risk assessment for a target based on identified threats, vulnerabilities and consequences. The September 2006 revision covers NSLS-II and identifies that the construction project security is ongoing and that physical and intellectual security recommendations have been submitted to the project. To meet the requirement in DOE Order 413.3 to update the “Security Vulnerability Assessment Report” and to finalize it prior to CD-4, the Laboratory Protection Division provided a memorandum to the project stating that NSLS-II is in fact addressed in the Report of Assessment of Security Risk at BNL and its revisions. This memorandum will again be updated prior to CD-4 closeout.

The physical security systems at NSLS-II were designed to meet the requirements of the Laboratory and include intrusion detection and a card reader access control system. These security systems were designed with input from the Laboratory Protection Division and meet the requirements set forth in DOE Order 470.4-2A “Physical Protection” and all other applicable ODE orders, policies and standards.

Laboratory assets (including NSLS-II) are further protected by a highly trained, armed protective force of trained and certified Security Police Officers- Level One. They are on duty around the clock, ensuring an effective response to acts of theft, sabotage, vandalism, terrorism, arson, etc. This protective force is also trained to respond and provide assistance during natural disasters such as fire storms, and radiological/toxicological accidents. The protective force is an integral part of the aforementioned program initiatives and provides the most effective response and defense against potential malevolent acts to the laboratory population and assets.

Open Issues or Risks

No known open issues or unusual risks identified.

3.17 Permits and Licenses

No permits or licenses from regulatory authorities are required for full operation of the NSLS-II complex. Authority to operate is granted by the DOE Brookhaven Site Office subject to the DOE Orders and Guidance noted elsewhere in this document as well as the terms and conditions of the DOE's contract with Brookhaven Science Associates.

Open Issues or Risks

None Identified

3.18 Authorization and Notification

Project completion (CD-4) will be accomplished when the scope defined to level 3 in the WBS Dictionary has been delivered and demonstrated to be functioning by achieving the Threshold Key Performance parameters at Project Completion listed in Table 3.10.1. Prior to CD-4, a period of commissioning and performance testing for NSLS-II will be completed as technical systems and facilities are installed. When the scope defined to level 3 in the WBS Dictionary has been delivered and demonstrated to be functioning by achieving the Threshold Key Performance parameters at Project Completion and has been certified to operate properly and safely, the project and DOE managers will recommend facility acceptance and approval of CD-4 is approved by the SAE.

Throughout the commissioning period and later into operations, authority to operate all NSLS-II systems will be granted under DOE Order 420.2B Safety of Accelerator Facilities. The key documents and actions described in Section 3.15 are approved by the BHSO manager. The phased commissioning of facility systems occurs as equipment and utility services are placed into service. Commissioning begins with the electron source, progresses through the linac and finally to the storage ring systems. Commissioning of the beamlines and instruments is a post project activity. An Accelerator Commissioning Plan and Beamline Commissioning Plan will be developed to describe the objectives of each phase of commissioning. These plans will call for sequential commissioning modules, beginning with the electron source and concluding with the storage ring commissioning.

DOE is the approval authority to allow commissioning. This approval authority has been delegated to the Brookhaven Site Office (BHSO) for the NSLS-II accelerator. This approval requires a detailed authorization process, which addresses all of the relevant issues such as completeness of documentation, technical readiness, the training of the staff, the existence of detailed commissioning procedures, the assessment of hazards, safety and emergency procedures.

Open Issues or Risks

None identified at the initial drafting of the PTOP.

3.19 Project Transfer to operations

The DOE Program/Project team will conduct a Project Completion Review to meet the objective of the “operational readiness review” described in DOE Order 413.3A Program and Project Management for the Acquisition of Capital Assets. This review at completion of the performance tests will be documented in a Project Completion Report, which will serve as the basis for a requirement for SAE approval for CD-4. For project completion (CD-4), NSLS-II must have in place all capital facilities defined to level 3 in the WBS Dictionary, and have conducted initial performance tests to demonstrate operation to meet the NSLS-II Threshold Key Performance Parameters and Project Completion contained in Table 3.10.1 of this document. Approval of CD-4 completes the construction phase of the project, and NSLS-II will enter the normal research operations phase.

Open Issues or Risks

None identified at the initial drafting of the PTOP.

3.20 Business Functions

Business functions for the entire Photon Sciences directorate, including the NSLS-II project, are provided through a Service Level Agreement between Photon Sciences and the BNL Business Operations directorate. That agreement was put in place on February 16, 2011 and allows for the provision of business functions from BNL to Photon Sciences. A 5-year plan was provided to the Business Operations directorate as part of the agreement which shows the level of staffing required over that time period. An updated staffing forecast will be provided to the BNL Business Operations directorate each year.

As portions of the NSLS-II Project are completed and once beneficial occupancy is received, the costs associated with that portion of the project will be transferred to the fixed assets accounts of the Laboratory.

All records associated with the NSLS-II project will be identified, maintained, stored and retained by the Photon Sciences Records Management Representative in accordance with the requirements of BNL's Records Management subject area.

Licenses and existing contracts will be transferred to the operating organization as appropriate through modifications to the agreements with suppliers and through organization coding changes to the BNL PeopleSoft financial system. Equipment and other assets purchased as a part of the NSLS-II project will be dispositioned either by turning in equipment that is no longer required to the BNL Property Management Group where it will either be added to the laboratory-wide equipment pool or disposed of through the formal excess disposal process. Both dispositions will take place in accordance with the Procurement and Property Management Standard Operating Procedures.

Government-furnished equipment that is provided to contractors will be returned to BNL as per the terms of the contractual agreement currently in place between the two parties.

Unresolved project litigation and liabilities will be handled through the Brookhaven Legal Office and, if appropriate, accruals for any outstanding liabilities will be made prior to project closeout.

Open Issues or Risks

None identified at the initial drafting of the PTOP.

3.21 Project Information and Records Turnover

The Business Division in the Photon Sciences directorate coordinates directorate-wide information technology and information management systems. The NSLS-II Project has established the document management system and follows the BNL and PS records management process which is administered by the NSLS-II Project Documents and Records Administrator. The NSLS-II Project will provide electronic files for

- design basis documents
- specifications
- as-built drawings
- equipment manuals
- warranties
- test reports
- operation and maintenance manuals
- training materials
- agreements and acceptance documents
- ES&H documents
- configuration management documents

which were produced during the project life time. A detailed list of these documents will be kept in the Project Document System. At the completion of the project, the contents of the NSLS-II Project Document System and project records will be handed over to the Photon Sciences directorate document and records management system.

Open Issues or Risks

None identified at the initial drafting of the PTOP.

3.22 Transition to Operations Reporting

Project completion (CD-4) will be accomplished when the scope defined to level 3 in the WBS Dictionary has been delivered and demonstrated to be functioning by achieving the Threshold Key Performance parameters at Project Completion listed in Table 3.10.1. Prior to CD-4, a period of commissioning and performance testing for NSLS-II will be completed as technical systems and facilities are installed. When the scope defined to level 3 in the WBS Dictionary has been delivered and demonstrated to be functioning by achieving the Threshold Key

Performance parameters at Project Completion and has been certified to operate properly and safely, the project and DOE managers will recommend facility acceptance and approval of CD-4 is approved by the SAE.

Throughout the commissioning period and later into operations, authority to operate all NSLS-II systems will be granted under DOE Order 420.2B Safety of Accelerator Facilities. The key documents and actions described below are approved by the BHSO manager. The phased commissioning of facility systems occurs as equipment and utility services are placed into service. Commissioning begins with the electron source, progresses through the linac and finally to the storage ring systems. Commissioning of the beamlines and instruments is a post project activity. An Accelerator Commissioning Plan and Beamline Commissioning Plan will be developed to describe the objectives of each phase of commissioning. These plans will call for sequential commissioning modules, beginning with the electron source and concluding with the storage ring commissioning.

An NSLS-II Pre-Installation Policy and Requirements document will be prepared to communicate policy/requirements and assign responsibilities for the receipt and management of technical components and documents in order to ensure readiness for installation. All NSLS-II divisions are responsible for the implementation of this policy.

Hand-off agreements will be developed between the NSLS-II divisions, providing details of responsibilities and the materials, equipment, documentation, etc. to be delivered for the transition from construction to operations.

Components, subsystems, and systems will be turned over to Operations as the completion of installation and acceptance testing. A variety of procedures and division- specific plans will be developed to provide details of responsibilities and to describe the materials, equipment, documentation, etc., to be turned over for operations.

- NSLS-II Pre-Installation Policy and Requirements
- NSLS-II Accelerator Turnover Plan
- NSLS-II Accelerator Systems Division Installation Plan
- NSLS-II Accelerator Systems Division Commissioning Program Plan
- NSLS-II Experimental Facilities Division Instrument Systems Integrated Installation Plan

Open Issues or Risks

This process has been outlined at a conceptual level and needs to be further detailed and resources assigned as the transition to operations proceeds.

3.23 User/Operating Staff Planning

The Photon Sciences management team has developed detailed estimates for the operation of the NSLS-II facility under a number of different funding scenarios. These estimates include the materials, labor, and utilities costs associated with the operation of the facility under these various scenarios. The estimates include the type of labor required to accomplish the work, material lists, and anticipated utilities requirements. An assumptions document accompanies

these estimates, detailing out the programmatic, scope and cost assumptions that were used to develop the estimates. Initial operations activities begin in FY2013 so that NSLS-II systems that are turned on prior to CD-4 can be operated to bring other systems on line. Existing staff from the NSLS-II Project, from NSLS operations, and from the Laboratory support organizations will be trained on these new systems so that they their operations are understood and so that the staff will be well-equipped to run the NSLS-II facility.

Open Issues or Risks

Further refinement of these estimates will be required once the funding amounts become more definite.

3.24 Lessons Learned

Lessons learned and best practices identified during the transition to operations period will be documented by following the same process which was implemented for the NSLS-II Project. The lessons learned documents will describe best practices and opportunities for improvement identified by the NSLS-II Project in order to maximize the opportunities for future project successes; working safely, within cost and schedule, and meeting or exceeding performance objectives. The final document will be published as a part of NSLS-II CD-4 approval documents and shared with future projects to be carried out by Photon Sciences, other BNL directorates, and other DOE sites.

Open Issues or Risks

None identified at the drafting of the PTOF.

3.25 Project De-staffing Plan

The NSLS-II Project maintains a detailed staffing plan that identifies each individual contractor workforce member that is currently supporting work on the NSLS-II Project. This plan reflects actual time charged to date and projected time (by year) for the balance of the project.

Operations plans have been developed that show staff that will move to operating activities. Detailed estimates for the follow-on beamline projects are being developed and also include staffing requirements by year. Most NSLS-II staff will have roles in either operations or follow-on projects. For those that don't, the Business Division Director and the appropriate Technical Division Director will develop a plan, by individual or type of individual, that will outline the destaffing strategy. This strategy may include working with Human Resources to find other roles within the Laboratory, with other projects throughout the DOE complex, or with outside organizations. The plan for some individuals might include retention bonuses to ensure that the required work to complete the project is accomplished. This process has already begun in the Facilities Division, which is the first Photon Sciences Division to complete work on NSLS-II.

The DOE workforce dedicated to the NSLS-II Project consists of the Federal Project Director and the Deputy Federal Project Director. Both individuals have other duties within the DOE Area Office. Work within the office will be reorganized and reprioritized as the NSLS-II Project ramps down and as other project work ramps up. Area Office staff to support the FPD and the Deputy have been matrixed to assist and will also be diverted to other upcoming project work.

Open Issues or Risks

None identified at the drafting of the PTOP.